

We claim:

1. A method for optimizing energy consumption and energy cost at an end-user facility comprising the steps of:

5 gathering information about energy consumption requirements of an end-user;
retrieving information on the availability of energy supplied by energy suppliers to end-users;

10 compiling a list of energy usage options, for energy consumption of a particular device within a particular time period, based on energy consumption requirements and energy availability, said energy use options including energy supply entities and end-users that generate energy;

selecting the energy use option from the compiled list that provides the optimal energy use for a particular device; and

15 implementing the selected energy use option at the end-user facility.

2. The method as described in claim 1 wherein said gathering information step comprises determining the number of devices of the user that require the consumption of energy in order to operate.

20 3. The method as described in claim 2 wherein said information gathering step further comprises gathering information on each such device of the user, such information comprising the amount of time that the device will be operating, the preferred time of day for operating the device, the types of energy required by the device and the amount of energy typically use by the device in standard operations.

25 4. The method as described in claim 3 wherein said information retrieval step comprises retrieving information on each energy resource, such information comprising the types of energy provided by the resource, the amount of energy available over a particular time range, and the price of the energy of the particular time range.

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5. The method as described in claim 4 wherein said compilation of optimal energy use options list comprises the steps of:

creating, from energy consumption requirements information, an energy consumption policy for each device that will consume energy;

5 creating an energy availability profile from the information retrieved on each energy source;

comparing the energy requirements of a device for which energy is desired with the available energy from the energy resources; and

generating a list of optimal energy resources based on said comparisons.

10 6. The method as described in claim 5 wherein the selection of an energy resource is based on a match between the amounts of energy required by a device for operation and the quantity of energy available from each of the energy suppliers during a particular time range.

15 7. The method as described in claim 5 wherein said selection and implementation steps are automatically performed based on established end-user energy consumption policies.

20 8. A method for optimizing energy usage at an end user site comprising the steps of:
determining a cost for generating energy at the end user site;
determining the cost of purchasing energy from another energy supplier;
establishing a set of end-user energy policies for generating and using energy at the end-user facility; and

25 generating a set of energy supply alternatives based on the energy user requirements and the cost of the energy alternatives.

30 9. The method as described in claim 8 further comprising after said generating step, the step of selecting an energy alternative that provides optimal energy usage, said selection being based on said established end-user energy policies.

10. The method as described in claim 9 wherein said end-user energy policy is based on the lowest energy cost and the closest available time to a preferred time of the user.

11. The method as described in claim 9 further comprising after said selection step,
5 steps for implementing a pre-programmed operation of the particular appliance or application using energy from the selected energy option.

12. The method as described in claim 11 wherein said implementing steps are automatically performed.

13. The method as described in claim 9 further comprising when the selected alternative is the end-user the steps of:

generating energy at the end-user facility;
using said generated energy as desired by the end-user; and
15 selling any excess generated energy to other end-users or to energy suppliers.

14. The method as described in claim 13 wherein said energy selling step comprises:
placing information about available energy in a location accessible to potential energy purchasers;
20 negotiating the price and quantity of the energy with a potential energy purchaser;
and
consummating the transaction with the potential energy purchaser.

15. The method as described in claim 14 wherein said negotiating step comprises:
25 receiving an offer from a potential purchaser to buy energy, said offer containing a desired energy quantity and purchase price;
determining whether to accept the offer, reject the offer or to submit a counter offer to the potential purchaser; and
submitting a response to the potential energy purchaser.

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16. The method as described in claim 9 further comprising when the selected alternative is the end-user the steps of:

submitting an offer to purchase energy to the selected energy supplier;
receiving a response to the energy purchase offer from the selected energy

5 supplier; and

consuming the transaction with the energy purchaser.

17. A system for optimizing energy consumption and energy cost at an end-user location comprising:

10 an end-user controller including an accounting program and a memory operatively connected to said accounting program, said controller capable of identifying energy usage options;

a terminal, adapted to enable an end-user to communicate with said controller for the purpose of transmitting information about appliance operating requirements to said

15 accounting program;

an energy information storage facility for storing and maintaining information about available energy sources for the end-user;

a decision-making entity that automatically selects and implements an optimal energy option, the selection and implementation being based on an established end-user

20 energy consumption policy; and

a communication network the enables communication between said end-user controller and said energy information storage facility.

18. The system as described in claim 17 wherein said end-user controller is adapted to
25 retrieve from said storage facility information about energy options.

19. The system as described in claim 17 wherein said decision-making entity is contained in said end-user controller.

30 20. The system as described in claim 18 wherein said energy information storage facility is an energy accounting server.

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21. The system as described in claim 20 wherein said accounting server contains information about available energy supplies, said information includes types of energy available, quantity of energy available from each energy supplier and price of energy from each energy supplier.

22. The system as described in claim 21 wherein said stored information is arranged such that information for each energy supplier is arranged in a record containing fields with the types of information in each field.

23. The system as described in claim 21 wherein said accounting server further contains information about energy compensation options such as bartering, auctions and fix prices.

24. A computer program product in a computer readable medium for optimizing energy usage at an end user site comprising:

instructions for determining a cost for generating energy at the end user site;

instructions for determining the cost of purchasing energy from another energy supplier;

instructions for establishing a schedule for generating and using energy at the user end; and

instructions for generating a set of energy supply alternatives based on the energy user requirements and the cost of the energy alternatives.

25. The method as described in claim 24 further comprising after said generating instructions, instructions for selecting an energy alternative that provides optimal energy usage, said selection being based on said established end-user energy policies.

26. The method as described in claim 25 further comprising after said selecting instructions, instructions for implementing a pre-programmed operation of the particular appliance or application using energy from the selected energy option.

5 27. The computer program product as described in claim 24 further comprising when the selected alternative is the end-user the instructions for:

generating energy at the end-user site;

using said generated energy as desired by the end-user; and

selling any excess generated energy to other end-users or to energy suppliers.

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28. The computer program product as described in claim 27 wherein said energy selling instructions comprise:

instructions for placing information about available energy in a location accessible to potential energy purchasers;

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instructions for negotiating the price and quantity of the energy with a potential energy purchaser; and

instructions for consummating the transaction with the potential energy purchaser.

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29. The computer program product as described in claim 28 wherein said energy negotiating instructions comprise instructions for:

receiving an offer from a potential purchaser to buy energy, said offer containing a desired energy quantity and purchase price;

determining whether to accept the offer, reject the offer or to submit a counter offer to the potential purchaser; and

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submitting a response to the potential energy purchaser.

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30. The computer program product as described in claim 25 further comprising when the selected alternative is the end-user:

instructions for submitting an offer to purchase energy to the selected energy supplier;

instructions for receiving a response to the energy purchase offer from the selected energy

supplier; and

instructions for consummating the transaction with the energy purchaser.

31. A computer program product in a computer readable medium for optimizing energy consumption and energy cost at an end-user facility comprising:

instructions for gathering information about energy consumption requirements of an end-user;

instructions for retrieving information on the availability of energy supplied by energy suppliers to end-users;

instructions for compiling a list of energy usage options for energy consumption for a particular device within a particular time period, based on energy consumption requirements and energy availability, said energy use options including supply entities and end-users that generate energy;

instructions for selecting the energy use option from the compiled list that provides the optimal energy use for a particular device; and

instructions for implementing the selected energy use option at the end-user facility.

32. The computer program product as described in claim 30 wherein said gathering information instruction further comprises instructions for determining the number of devices of the user that require the consumption of energy in order to operate.

33. The computer program product as described in claim 31 wherein said information gathering instruction further comprises gathering information on each such device of the user, such information comprising the amount of time that the device will be operating, the preferred time of day for operating the device, the types of energy required by the device and the amount of energy typically use by the device in standard operations.

34. The computer program product as described in claim 32 wherein said instruction for information retrieval of available energy resources comprises retrieving information on each energy resource, such information comprising the types of energy provided by the resource, the amount of energy available over a particular time range, and the price of the energy of the particular time range.

35. The computer program product as described in claim 34 wherein said instruction for compilation of optimal energy use options list further comprises:

instructions for creating, from energy consumption requirements information, an energy consumption policy for each device that will consume energy;

instructions for creating an energy availability profile from the information retrieved on each energy source;

instructions for comparing the energy requirements of a device for which energy is desired with the available energy from the energy resources; and

instructions for generating a list of optimal energy resources based on said comparisons.

36. The computer program product as described in claim 35 wherein the selection of an energy resource is based on a match between the amounts of energy required by a device for operation and the quantity of energy available from each of the energy suppliers during a particular time range.

37. The computer program product as described in claim 35 wherein the selection of an energy resource is based on an optimal energy policy for the particular end-user device.